3 June, 1999

Febrile Respiratory Illness Testing Update
Emerging Illness Division
Naval Health Research Center
June 1998 – April 1999

Background – Naval Health Research Center (NHRC), San Diego, has been conducting surveillance of febrile respiratory illness (FRI) at military recruit camps since June 1998. Seven training camps, representing 4 service branches, along with Ft. Bragg (a non-training installation), report FRI rates to NHRC each week (Figure 1). Viral throat culture specimens are taken from a systematic sample of ill recruits, and the specimens are shipped to NHRC to undergo testing for viral pathogens including influenza A and B, adenovirus, respiratory syncytial virus (RSV), and parainfluenza. FRI rates and viral testing results are posted on the Navy Emerging Infections web site:
http://pc176.nhrc.navy.mil:80/disease/ilirates.htm#top

Current progress – Testing has been completed for 1,267 specimens taken between 8 June 1998 and 15 April 1999. Summary results are shown in Table 1.

Influenza – To date, 211 (16.7%) of the specimens have been positive for influenza, with type A accounting for 81% of the positives and type B the remaining 19%. Among the positive trainees for whom vaccination status was known, 81/203 (40%) had received influenza vaccine more than 2 weeks prior to illness. This is not entirely surprising, as almost 2/3 of specimens were from such vaccinated trainees, and the vaccine has an estimated efficacy of only 70-80%. Subtyping of several of the isolates from vaccinated trainees suggests that they are common, vaccine-covered strains. Despite these "failures", the vaccine appears to be beneficial, as among trainees having FRI symptoms, unprotected trainees (no vaccine or < 2 weeks post-vaccine) were 3 times more likely to test influenza-positive (OR 3.05, 95% CI 2.21 – 4.21) than vaccinated trainees.

Adenovirus – Adenovirus has clearly been the leading cause of FRI among recruits, as 53% of all specimens tested to date have been positive. The proportion of disease caused by adenovirus varies greatly by location, ranging from 10.3% (Lackland AFB) to 84.8% (NTC Great Lakes). Because adenovirus vaccine is only given seasonally to conserve existing supplies, more than 80% of the specimens tested to date have come from unvaccinated personnel. We have recently begun serotyping of the isolates.

Other pathogens – RSV, parainfluenza 1, parainfluenza 2, and parainfluenza 3 were isolated in 1.7%, 0.9%, 0.7%, and 1.2% of the specimens, respectively.

Negative specimens – Approximately one-third of the specimens were completely negative for virus. The proportion of specimens testing negative varied greatly by location, with NTC Great Lakes, MCRD San Diego, and Ft. Bragg having a relatively low proportion of negative specimens.

Temporal trends – Monthly adenovirus and influenza infection rates are shown in Figures 2 and 3. The rates are calculated by multiplying the FRI rate by the proportion (%) of specimens testing positive for adenovirus and influenza. Adenovirus infection rates rose in late summer and early fall, remaining high through November, and tapering off in December and January (Figure 2). As adenovirus rates were decreasing, influenza infection rates were increasing at many sites, and have remained above baseline levels at most sites through March (Figure 3). Despite high vaccination levels, the influenza attack rate at Ft. Jackson has been more than 0.25 cases/100 trainees/week for 4 consecutive months.

Figure 1.

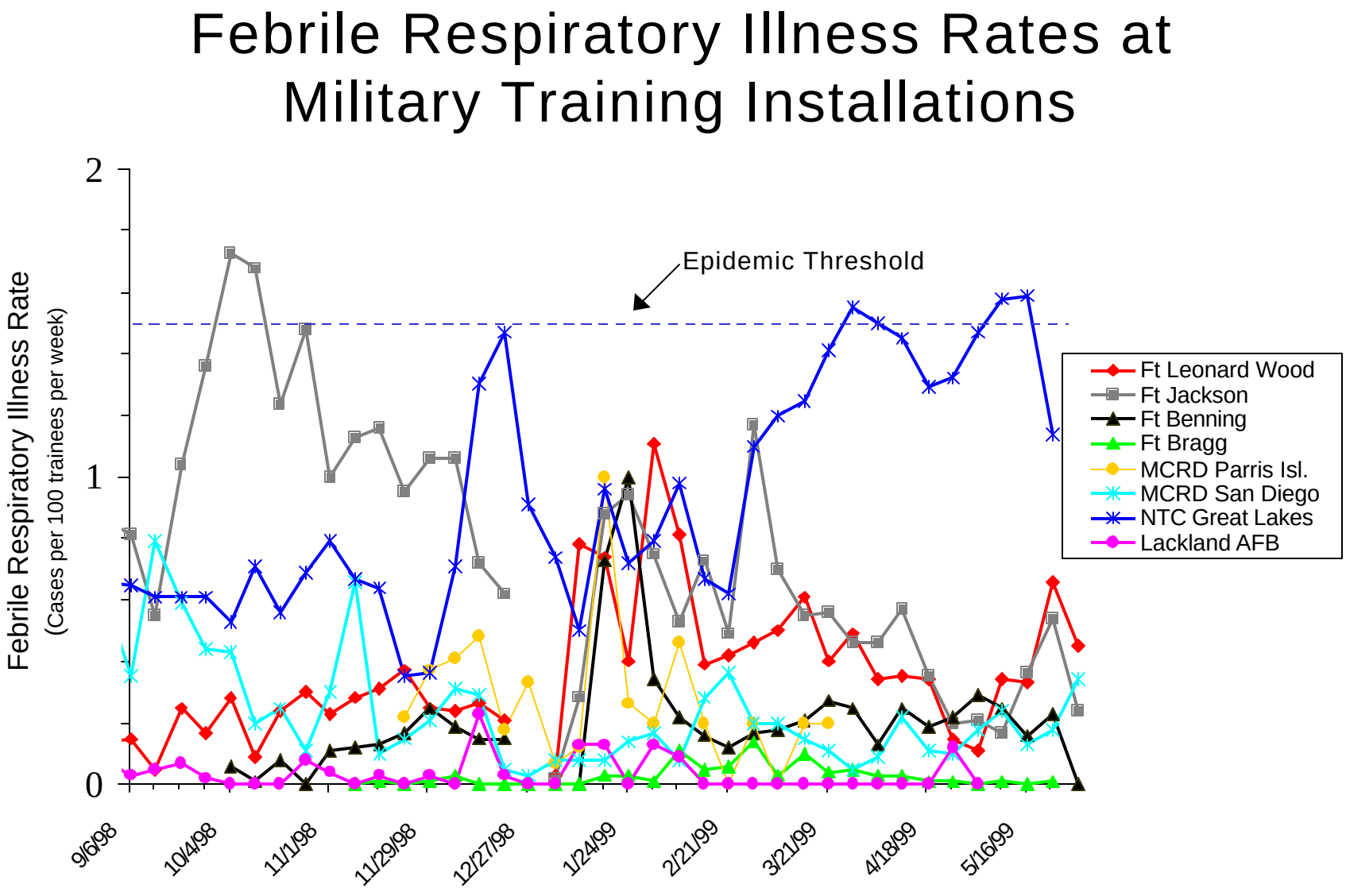
Febrile Respiratory Illness Rates at Military Training Installations
Febrile Respiratory Illness Rate
(Cases per 100 trainees per week)
2
1
0
Epidemic Threshold
Ft Leonard Wood
Ft Jackson
Ft Benning
Ft Bragg
MCRD Parris Isl.
MCRD San Diego
NTC Great Lakes
Lackland AFB
9/6/98
10/4/98
11/1/98
11/29/98
12/27/98
1/24/99
2/21/99
3/21/99
4/18/99
5/16/99

Table 1. Summary of viral testing results for specimens taken between 8 June 1998 and 15 April 1999. Specimens were obtained from military trainees who sought medical care and had an oral temperature of ≥ 100.5°F and cough or sore throat.

	Great Lakes	MCRD San Diego	Ft. Leonard Wood	Ft. Jackson	Lackland AFB	Ft. Benning	Ft. Bragg	Total
Number tested	223	160	150	595	29	94	16	**1267**
% Influenza	9.9	8.7	14.7	20.0	13.8	17.0	87.5	**16.7**
% Type A	7.2	8.1	14.0	15.0	13.8	14.9	87.5	**13.5**
% Type B	2.7	0.6	0.7	5.0	0	2.1	0	**3.2**
% Adenovirus	84.8	81.9	16.0	48.7	10.3	36.2	0	**53.0**
% RSV	1.8	3.8	2.0	1.2	3.4	0	0	**1.7**
% Parainfluenza 1	0.4	1.3	0.7	1.0	0	1.1	0	**0.9**
% Parainfluenza 2	0.4	0.6	0.7	1.0	0	0	0	**0.7**
% Parainfluenza 3	0.4	1.9	2.7	1.2	0	0	0	**1.2**
% Negative	12.1	13.1	66.7	35.0	75.9	46.8	12.5	**33.5**

Note: Column percentages total more than 100 percent because some specimens were positive for more than one virus.

Figure 2. Adenovirus infection rates at military training camps.

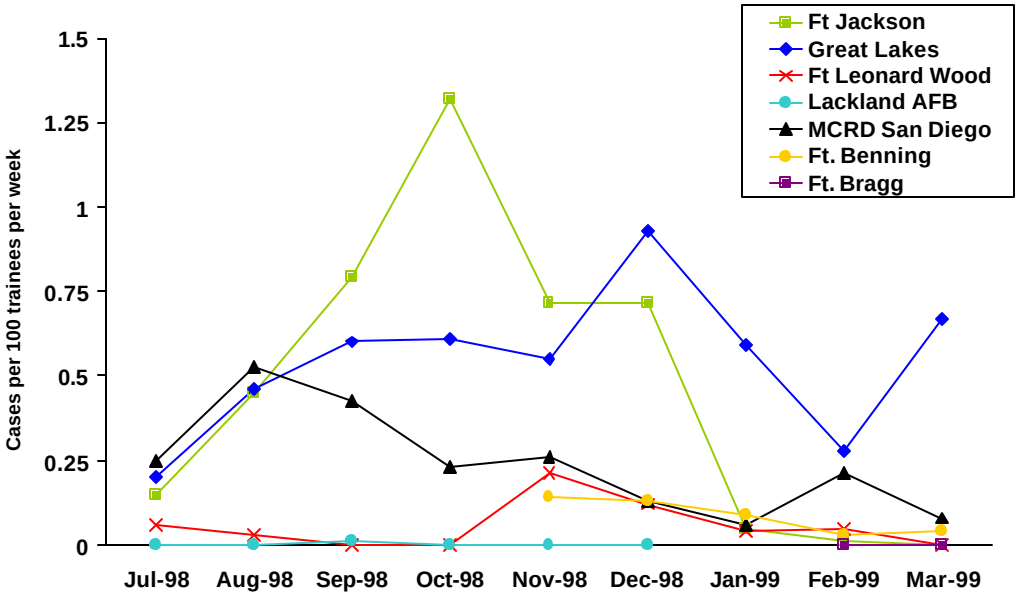

Figure 3. Influenza infection rates at military training camps.